DEVICE FOR ADJUSTING THE POSITION OF A SENSING ELEMENT UNIT IN ACCORDANCE WITH THE INCLINATION OF A SEGMENTED SANDING BLOCK, AND A CONTROL UNIT FOR ITS REGULATION

BACKGROUND OF THE INVENTION

This invention is concerned with the field of belt sanding systems. It describes the change of positioning of the sensing element unit when a segmented sanding block is inclined, and the control unit for individual regulation of each segment when the sanding block is inclined.

The inclination of a segmented sanding block is described in the patent application with international file number PCT/CH02/00415 and international application, dated 22/07/2002.

SUMMARY OF THE INVENTION

When the segmented sanding block of a throughfeed sanding machine is set to an inclination with respect to the feed direction, the problem arises of the loss of alignment of the sensing element series with respect to the different, for example perpendicular, positioning of the segment series. The invention shows the compensation for the arising configuration variations through the lateral translocation of the sensing elements by means of a leverage system, or through the rotation of the sensing element series in parallelogram configuration. The use of segments via the communication of workpiece characteristics by the sensing elements is regulated by an individually programmable electronic control unit.

BRIEF DESCRIPTION OF THE DRAWINGS

To illustrate this invention:

Drawing 1 with representation of the starting position, namely the arrangement of the segmented sanding block with the individually controllable segments (11), the sanding belt deflecting rollers (12 and 13), as well as the sensing elements (15) positioned prior to the block in the feed direction (14). d is the distance between the sensing elements (15), s that between the segments (11). T_1, T_n are selected sensing elements and S_1, S_n the corresponding segments.

Drawing 2 with representation of the same arrangement as Drawing 1, but with the segmented sanding block (11, 12, 13) rotated through angle α.

Drawing 3 with a starting position as in Drawing 1, but with a leverage device (16) for the sensing elements (15), which as per Patent Claim 1 effects a lateral displacement when the sanding block rotates.

Drawing 4 with the same arrangement as Drawing 3, but with the segmented sanding block (11, 12, 13) rotated through angle α.

Drawing 5 with the same arrangement and equipment as Drawing 4, but with an additional scissor system (17), which in accordance with Patent Claim 2 evens out the separation of the sensing elements (15).

Drawing 6 shows a machine (18) in parallelogram configuration, in which the sensing elements (15) are moved with and in parallel to the segments (12).

Drawing 7 with the same arrangement and equipment as Drawing 6, but with the segmented sanding block (11, 12, 13) rotated through angle α.

DETAILED DESCRIPTION OF THE INVENTION

In the current state of technology, the intellectual property right claims cover the advantages of the inclination of a segmented sanding block assembly and the combinations of an inclinable belt-sanding assembly with a segmented sanding block and/or low sanding belt speeds, as reported in Patent Application PCT/CH02/00415 with submission date 22/07/2002.

Since the inclination of the sanding belt alters the position of the segments (11) relative to the sensing elements (15), the workpiece characteristics are incompletely or incorrectly transmitted to the corresponding segments (15) by the sensing elements 15, if this discrepancy is not compensated for accordingly in the segment application.

Drawing 1 shows the situation with straight sanding unit, for which distance d between the sensing elements matches distance s between the segments. Sensing element T_1, and segment S_1, and sensing element T_n and segment S_n, lie along lines parallel to the feed direction. When the segment series rotates around angle α, as shown in Drawing 2, distance s reduces relative to distance d. In addition, T_1 and S_1, and T_n and S_n, are no longer aligned. This discrepancy has the consequence that, as mentioned, the segments (12) in their application no longer match the workpiece characteristics as determined by the sensing elements (15).

The following devices are designed to correct these positioning variations:

A leverage system, as shown in Drawing 3, or with a servomotor, which principally brings sensing elements $T_1...T_n$ back into approximate alignment with segments $S_1...S_n$.

If in addition the arising discrepancy in the separation of the segments, due to the repositioning of the sensing elements, needs to be accounted for, the device as shown in Drawings 3 and 4 can be extended by a scissor system (17), as shown in Drawing 5.

A somewhat more elaborate design, which brings sensing elements $T_1...T_n$ in line with segments $S_1...S_n$, and so avoids also the separation error as shown in Drawing 2, is shown in Drawings 6 and 7, with a rotating device (18) for the sensing element series in parallelogram configuration.

For the device shown in Drawings 3,4, 5, due to the varying separation of the individual pairs of sensing elements (15) with the corresponding segments (12), the control system must act specifically for each of the pairs, and not as is possible uniformly for all sensing elements (15) and segments (12) in the standard design of straight sanding, as shown in Drawings 1 and 2, or in the parallelogram configuration as shown in Drawings 6 and 7. The control of the segments through the workpiece parameters transmitted by the sensing elements is done in the configuration as shown in Drawings 3,4, 5, by means of a specially programmed electronic control unit.